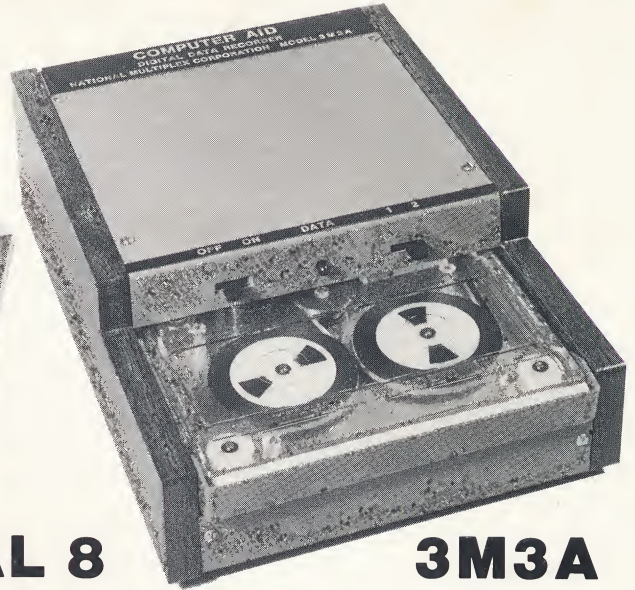


pec 77

SHORT FORM CATALOG



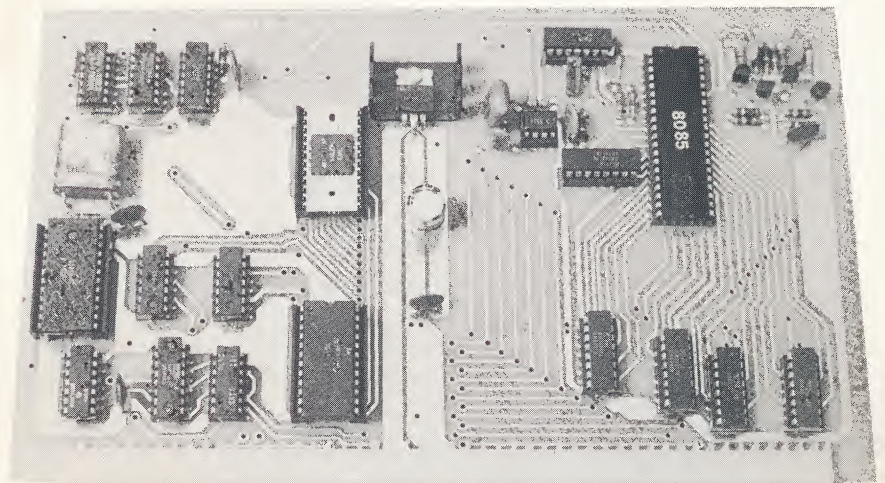
UNIVERSAL 8



3M3A



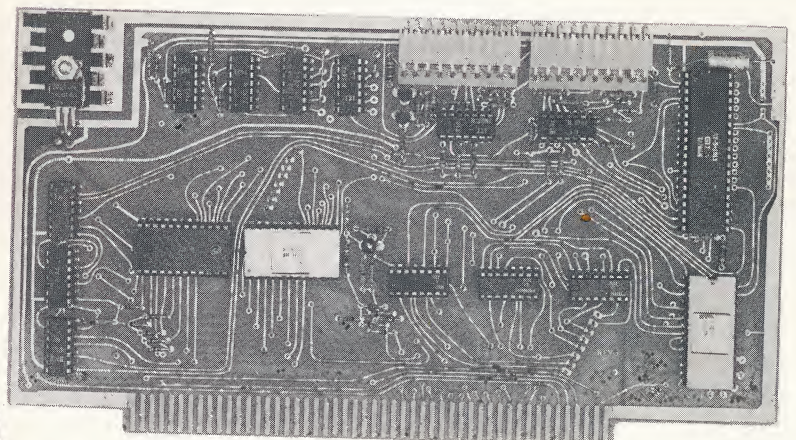
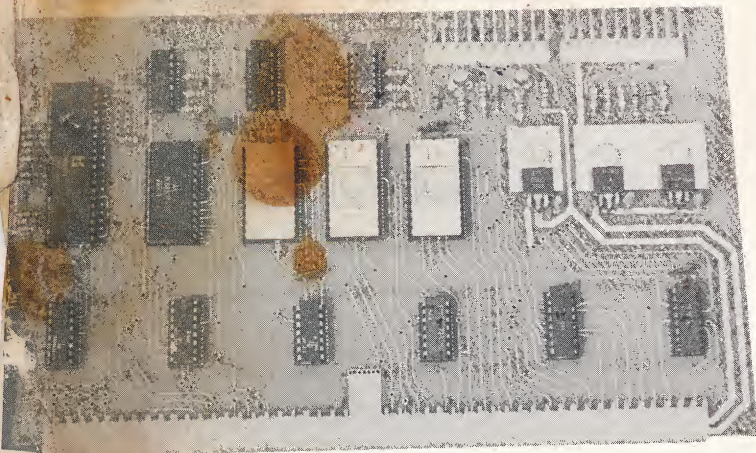
CC8



8085MPU

2S10 R) 6800

2S10(R) 8080



NATIONAL MULTIPLEX CORP.
3474 RAND AVE. BOX 238
SOUTH PLAINFIELD, N. J. 07080

UNIVERSAL 8

\$200.00 Kit. (Motherboard extra)

The UNIVERSAL 8 is a NEW COMPUTER MAIN FRAME designed for the man who wants to "Roll His Own". We have kept the best features of the competing models to enable you to put together a truly versatile computer. For example:

- 1) 25 amp power supply
- 2) Input port available from front panel switches.

PLUS - you can use the S100 bus or the 6800 SWTP bus. THEREFORE, you can use ANY of the following 8 bit MPU's.

8080 - 8085 - Z80 - 6800 - 6802 - 6809 - F8 - 2650 - SCAMP - 6502

WHY THE FRONT PANEL SWITCHES?

Most 8080 software demands them. You can't initialize MITS Basic without them. You can't stop a Processor Tech assembler without them. The IMSAI assemblers require them. You use them as if they were an I/O port. In 8080 systems it is port FF. In 6800 systems it is any port you connect the cable to. Use them to stop programs, alter programs, interrupt programs, switch programs, etc.

WHAT DO YOU PLUG IN THE MOTHERBOARD?

Anything you want. WE DON'T TIE YOU TO OUR CARDS. Use Z80 boards from TDL, Ithaca, S & D. Use 8080 boards from Electronic Control Technology. Use 6800 boards from SWTP. Use NATIONAL MULTIPLEX 8085 and 6802 boards. As for memory boards, the suppliers are too numerous to list - choose your own. If we don't make it, we can get it for you or you can purchase direct. The recommended CPU/MPU boards have power on or reset jump to the monitor address.

BELOW is a partial listing of available boards.

	KITS	Assembled & Tested
Z80 MPU	\$150.00	\$200.00
8080 MPU	120.00	170.00
8085 MPU	140.00	190.00
8K RAM S100 250 NS	140.00	190.00
MOTHER BOARDS		
S100	35.00 ea.	
SWTP 50	40.00 (Connectors included)	
Connectors for S100	5.00 ea.	
2SIO(R) for 8080 or 6800	\$160.00	\$190.00

2S10R 8080

COMPUTER OPERATING SYSTEM with ROM and TAPE DRIVE CONTROL
(The Bootstrap Eliminator) \$160, Kit. \$190.00; Assembled.

The 2SIO(R) Board makes any 8080 based computer a turnkey system - JUST TURN ON and GO. Both TERMINAL and TAPE I/O ports are included so you need only this one I/O board.

- 1) Connects any Terminal (20 ma., RS232 or TTL) to your computer.
- 2) Connects any digital tape unit to the computer.
- 3) All controlling programs are in ROM - NO BOOTSTRAPPING.

One kilo-byte of ROM is provided for operation. Starts and stops tape units automatically while loading and dumping formatted files. This ROM has all of the necessary Terminal and Cassette control programs. See the listing below.

The 2SIO(R) board has two ports, independently baud rate selected. Port I using a UART is for the terminal - either CRT or mechanical. It can also be used to enter MITS programs which have not as yet been converted to high baud rate tapes. Port II using a USART is for one or two tape drives used either synchronously or asynchronously. The tape drives may be used independently as separate read and write units, or as a single drive which serves as a dual purpose unit. Maximum baud rates are in the 40-50 kilobaud region. This port can be used to enter IMSAI software before conversion to high baud rates. It is used thereafter for all cassette loads and dumps - automatically under software control.

When the computer is first turned on, address C000 is examined (or reset jump is executed.) (switches A₁₄ and A₁₅ up). This starts the monitor program which types a "Ready" signal. The user then types in what he desires, such as loading, searching, etc. and the ROM executes the program. The ROM also takes care of time delays in cassette starts so that no additional circuitry is required. Remember, cassette start/stops are under software control. So are rewind and fast forward with appropriate tape units such as the 3M3A.

This I/O board comes in three versions. Rev.6 for single 3M3A's or dual CC-8's in 4MHZ Z80 or 8080 systems. Rev.6A for dual 3M3A's in Z80 systems (4MHZ). Rev.7 using 2708 EPROM's is standard for 8080 systems and 2MHZ Z80 systems.

2S10R 6800

6800 COMPUTER OPERATING SYSTEM with ROM and TAPE DRIVE CONTROL
\$160, Kit. \$190.00, Assembled.

A new controller board with ROM for SWTP bus users. Fits the S50 bus and provides one terminal and one tape I/O port. Controls one or two recorders (CC-8 or 3M3A) and one other serial device (printer, terminal, teletype, tape reader, etc.) Has 3K of EPROM space on board for monitor programs. A 1K program is included on ROM to operate the recorders and terminal. Enables one to use the CC-8 recorder at 4800 baud and the 3M3A at 50 Kilobaud.

When the user resets, the 1K ROM monitor is entered automatically. MIKBUG stays in, but is no longer the primary monitor. It is used only for support routines.

See the ROM Program listing below. This ROM has all of the necessary terminal, punch tape and tape recorder programs; including file formatting and searches.

ROM

2SIO(R) 8080 and 2SIO(R) 6800

ROM COMMANDS (Partial Listing)

- | | |
|---|--|
| L Load memory in Hex Format | Control S and Control Z - Repeat search for files. Recovers all files with the same first four letter names. |
| D Dump Memory in Hex Format | |
| G GoTo an Address | C Change memory to the Hex Set given. |
| E Dump memory to tape in formatted form. | M Move a block of memory. |
| Uses 6 letter file name ahead of file. | B Back up one file to write over a file that has been previously loaded and worked on in the computer. |
| S Search for and recover file by six letter file name at NORMAL speed. | I Load a Checksum format paper tape. |
| Z Search for and recover file by six-letter file name at HIGH speed. | T Read paper tape in a binary format. |
| F Fast Forward keyboard control of recorder. | Control T - Punch tape in a binary format. |
| H Search for and recover file with a five letter string buried within the file. | W * Enter ASCII characters to memory. |
| | Control W* Print ASCII characters from memory. |
| | * (These are Word Processor Commands) |

CC8

4800 BAUD
DIGITAL DATA RECORDER, Model CC-8

\$175.00 (Assembled only)

An Asynchronous NRZ Recorder for use in data systems. No clocking required. Runs at any baud rate up to 4800.

USE IT FOR: PROGRAM RE-LOADING PROGRAM STORAGE MODEM RECORD/PLAYBACK
 DATA LOGGING WORD PROCESSING

- FEATURES:
- (1) Handshaking with Terminals and Modems. An RTS signal from the Computer, Terminal or Modem starts the motor. When the motor is up to speed, a CTS signal is returned to allow data to flow. When the RTS signal is removed, the Recorder stops.
 - (2) RS232 signals in and out. Interfaces directly to YOUR COMPUTER, TERMINAL or MODEM.
 - (3) TTL level signals are optional (user changeable). Normally shipped RS232.
 - (4) Speed adjustable. A variable speed control enables the Recorder to be set to match the speed of other recorders or to standardize speed for group users. Nominal 3.0"/sec. and 1.5"/sec.
 - (5)* ERROR RATE 1 in 10^8
 - (6) Recording Method - Tape Saturation Binary. NRZ ASYNCHRONOUS. Single track. This is not an audio recorder. No interface used. No FSK signals.
 - (7) Half-Track recording. Flip cassette over for second track. 100% TAPE INTERCHANGEABILITY.
 - (8) MOTOR START/STOP by local or REMOTE CONTROL. Rewind and fast forward are manual.
 - (9) TURNS COUNTER for approximate program location.

For 8080, Z80 and 8085 users, this recorder interfaces with our 2SIO(R) board for software control of start/stop. Data is recorded and played back by file name so that recovery is automatic. Recorder starts and stops under keyboard or computer control. For 6800 users an equivalent 6800 SIO(R) is available.

3M3A

DIGITAL DATA RECORDER
Model 3M3A

\$220.00 (Assembled only)

MODEL 3M3A SPECIFICATIONS:

- (1) Records at 19,200 baud with a tape speed of 12" per second. Plays back at 40-50 kilobaud.
- (2) Uses two track pairs. One track for clock and one track for data. A switch selects upper or lower track pair. Data capacity is approximately 2 megabytes.
- (3) Recording method is NRZ(tape saturation binary). No interfaces are used since this is not an audio recorder. Input and output levels are RS232 or TTL, user changeable. Data input and output are serial.
- (4) Operates under software control only. There are NO MANUAL OPERATING SWITCHES. Records a 1/1 clock on one track and plays back a 1/1 clock for the I/O device.
- (5) Motor control is normally supplied TTL for direct connection to a parallel interface. Can use a 6 bit control code or a 3 bit sequence control code. If necessary, RS232 control codes can be used in the sequence method.
- (6) Comes complete with 8080 or 6800 software for use with various I/O boards. The I/O boards designed for use with these recorders have the software blown in ROM.

8085MPU

8085 MPU for SWTP Bus

Now you can use 8080 software, BASIC etc. in your SWTP. This MPU board replaces your Motorola MPU board with the Intel 8085. Use it in conjunction with our 2SIO(R) 6800 and special ROM to be up and running in 8080 software. If you like, you can keep your SWTP I/O and use memory mapped I/O routines in the 8080 software to gain extra I/O ports.

ALL I/O routines are in ROM and you need only make calls from your 8080 software. When used with our "UNIVERSAL 8" frame, you also gain a front panel input port for program control.

8080 software is far more abundant than 6800 software. The BASIC INTERPRETERS are more extensive and the ASSEMBLERS easier to use.

NATIONAL MULTIPLEX CORP.
3474 RAND AVE. BOX 288
SOUTH PLAINFIELD, N. J. 07060